Introduction and Aim: Postpartum depression (PPD) is defined as the depressive mood developed within the first year after birth and it is considered as one of the important public health problems. It is known that the depressive mood of the mother causes breastfeeding rates to decline, disease rates of the babies to increase, a decline of demand in preventative health services, more exposure to domestic accidents and impairment of the development of the babies resulting in their height and weight percentiles for age being lower compared to other babies. The first negative effect of PPD that has significance on child development may be its effects on breast milk that causes child development to decelerate in the first years of life. We encountered a small number of studies in the literature that investigated the effects of the mother’s mood on the nutritional content of breast milk, which is the baby’s main source of nutrition (1, 2).

The content and amount of protein consumed in the initial two years of life have lifelong effects on the growth and development of the child. Despite having a relatively low level of protein (1%), breast milk is sufficient for babies because its proteins have a high level of bioavailability (3). While the protein level is at its highest after birth, it decreases over time. Furthermore, the level of proteins in breast milk differs between individuals and varies according to the mother’s diet (4). On the other hand, the level of free amino acids in breast milk is not affected by maternal or gestational age (5, 6).

It is known that the mood of the mother affects the content of breast milk (7). While previous studies showed that depressive mood causes a reduction in the levels of tryptophan, tyrosine, phenylalanine and methionine amino acids used in the synthesis of neurotransmitters such as serotonin and dopamine in the blood, there is no conclusive evidence in the literature that shows the effects of mother’s mood on the protein content of the breast milk (8). Although it was indicated that, postpartum depression might change the nutritional composition of breast milk, especially levels of amino acids such as tryptophan, tyrosine, phenylalanine and methionine, this finding has not been shown clearly in the literature.

In this study, we aimed to investigate the effects of mothers’ depressive mood on the levels of these amino acids, which are known to decrease in depressive patients, in breast milk.

Methods: Fifty-three mothers with children aged between 1 and 12 months were recruited in this descriptive cross-sectional study. The mothers’ state of mood was evaluated by using Edinburgh Postpartum Depression Scale (EPPDS). Scores equal to or higher than 12 was accepted as having a depressive mood. To prevent the milk content from being affected by diurnal release, both plasma and milk samples were collected between 08:00-10:00 a.m. and amino acid levels were measured by a high-performance liquid chromatography method.

Results: The mean age of the mothers and infants were 28 years (min 18-max 44) and 4 months (min 1-max 12), respectively. 36.9% of the participants were primary school graduates, 90.6% were housewives and 35.8% had EPPDS scores equal to or over 12. Plasma tryptophan, phenylalanine and methionine levels were significantly lower in mothers with EPPDS scores ≥ 12 compared to mothers with lower EPPDS scores. In addition, breast milk levels of the same amino acids were significantly higher in mothers with EPPDS scores ≥ 12 than in mothers with lower EPPDS scores. Also, no association was found between the breast milk tyrosine level and mothers’ depressive mood.

Discussion: The additional burden that is caused by pregnancy and subsequent lactation, together with both nutritional disorder and depressive mood may alter neurotransmitter synthesis and levels of plasma amino acids. Therefore, changes in the levels of neurotransmitters such as dopamine or serotonin that have a role in mood regulation occur. Alteration of mother’s plasma amino acid levels may affect the baby by changing the amino acid content of breast milk. It is known that free amino acids play an important role in early postnatal development but their biological importance on child development has not yet been clearly defined (9). Also, it has been shown that the levels of amino acids in breast milk are important for the protection of the baby from obesity and various metabolic disorders in later life (10). In that sense, determining the effects of mother’s mood on amino acid levels of breast milk may have clinical importance.

Conclusions: Our study showed that mothers’ depressive mood affected the amino acid levels of breast milk after birth. Despite our small sample size, our findings have the potential to contribute to the existing literature. To clarify the effects of mothers’ mood on the breast milk amino acid levels and infants’ wellbeing, future studies with a higher number of participants are warranted.

References: